STATE OF MINNESOTA **DISTRICT COURT**

COUNTY OF RAMSEY **SECOND JUDICIAL DiSTRICT**

Case Type: Civil - Other
Court File: 62-C3-99-010952

Power Line Task Force, Inc.,

Plaintiff,

v.

AFFIDAVIT OF DAVID A. BLECKER, P.E.

Minnesota Environmental Quality Board,

Defendant.

STATE OF WISCONSIN)
) ss
COUNTY OF DANE)

David A. Blecker, P.E., after being duly sworn on oath, states and deposes as follows:

1. I am making this statement in support of Plaintiff Power Line Task Force, Inc.'s Rule 60(b) Motion for New Trial/Relief from Judgment based upon newly discovered information.

2. I am a licensed Professional Engineer in good standing in the state of Wisconsin, and am President and Director of Earth Energy Systems, Ltd. I have been performing transmission system analysis since 1994 and have been doing utility system planning system and analysis since 1992. I have analyzed transmission expansion plans and testified and been accepted as an expert witness as to the plan's adequacy and prudency in four transmission line cases in various jurisdictions, including the Chisago powerline in Minnesota in a hearing before the Office of Administrative Hearings held for the Environmental Quality Board as part of a Power Plant Siting Act proceeding.

3. I have had the opportunity to review the packet of materials that to my information and belief were handed out at the October 18, 2000, Steering Committee meeting. These materials include a large map with the proposed transmission line upgrade from Red Rock to Wilson and three system alternatives; one line diagrams of the existing powerline, NSP's proposed project, and three systems alternatives; a 14 page packet with structure designs and electric, magnetic and noise graphs and tables; and a four page packet with tables of Projected Peak Loads, Transmission Line Data, Normal Line Loading, and Alternative Plan Comparison.

I have also had the opportunity to review the Envlranmentsl Assessment Worksheet, Pawer Line Task Force Comments on the EAW, Notes from the EQB Technical Meeting of August 10, 1999, the MEQB Meeting Minutes of September 16, 1999, the November 10, 1999, Memorandum of Bob Cupit to MEQB Members and Technical Representatives, and the November 18, 1999, Record of Decision.

4. This new information is important to the ultimate transmission planning decision because it was not until this time that alternatives had been disclosed, and knowledge of these alternatives and their impacts must be considered by the decision-maker in the choice of any course of action. The alternatives include one alternative with significantly less impact than the others because it relies on reconductoring an existing line rather than on an upgrade facilitated by new construction as proposed by the utility. The existance of these alternatives was disclosed in the MAPP plan, but the specifics of the alternatives were not disclosed until October 18, 2000. Because NSP is an active participant and leader in MAPP, NSP knew or should have known of these alternatives and disclosed them to provide a broader information base from which to make a responsible routing decision.

5. I will review the documents provided to the Steering Committee on October 18, 2000, individually to explain and interpret the representations made in these documents. Those documents regarding electric and magnetic fields and noise will not be addressed as this is not within my area ofexpertise.

One Line Diagrams

6. The applicants have a preferred route, Alternative 1, from the Red Rock substation, in Newport, terminating at the Wilson substation, in Bloomington, approximately 15 miles to the west, with interconnections at the Stockyard substation in So. St. Paul and Rogers Lake in Mendota Heights. The project requires building approximately 130 taller structure in areas that are densely populated, which is problematic due to the line's proximity to residences, concerns about EMF and land use issues.

7. Three alternate transmission routes have been identified and analyzed at some level, but we don't know how thoroughly based on the information available. Based on the one line diagrams, each of the three alternatives involves a line segment from the Red Rock to Stockyards substaticms, which is short, running under one mile. From there, Alternate 2 would have 4.3 miles of existing line reconductored to a larger diameter wire from High Bridge to Rogers Lake and would construct an additional 8.4 mile 115 kV line west from Rogers Lake to Wilson. Alternate 3 would rebuild an existing line going north 6.5 miles from Inver Grove to Rogers Lake on what is now an open line, and then 8.4 miles from Rogers Lake to Wilson. Alternate 4 would add 2 miles of new powerline in the south from Inver Grove to the Inver Hills generation plant and rebuild 6.5 miles of existing line from Inver Hills to Rogers Lake with the same Rogers Lake to Wilson line.

8. The total mileage of all lines is comparable (see Alternative Plan Comparison, para. 14 below), and each of the three alternatives requires some reconductoring, but the aggregate

impact is greater for constructing new lines than for reconducton'ng existing lines, so when evaluating each of these alternatives, it's more important to look at the type of activity that will be performed as compared to the total mileage of an individual alternative.

9. A review of the electrical performance of each of the alternatives based on the available information as identified by the CAT study shows comparable or similar electrical performance under normal operating conditions. Regarding the line outages, witb single and double contingency and overloaded facility notations in red on the One Line Diagrams, no information has been presented to show how these alternatives perform under contingency scenarios such as a loss of a critical powerline.

10. It appears that MAPP participated in a study of this area, as evidenced in MAPP's 1999 Update to the 1998 Regional Plan (See Ex. A Form 1 of 5 for Reporting Plans, MAPP # 123, 124, reporting 3 alternatives, and 0.5 miles of reconductor or thermal increase and 5.8 miles of rebuild or conversion, with summer rating (MVA) of 3 18), indicates that the system deficiencies and potential, system improvements have an impact on the greater NSP or MAPP region, If the situation were simply a local problem, it is unlikely that MAPP would be involved. Since MAPP is involved, it is reasonable to assume the system deficiencies and planned improvements have system impacts beyond the local area. This may be an important factor if and when NSP tries to recover its project costs through its rates.

"sys_data.xls" Packet

11. NSP Red Rock - Projected Peak Loads.

MVA in essense equals megawatts. This chart shows each of the existing substation's capacity. Note that each substation has two transformers and each has a total capacity of 93-94 megawatts, Under normal conditions, according to NSP's own Metro Study, we

can see that the projected peak load at each of the substations is below the substation rating. What they don't show us is what the peak loads would be under the contingency that they're trying to plan for, such as those in the One Line Diagrams. We don't know haw severe the problem is that they're trying to solve. In the abscence of this information, it is difficult for decision-makers to evaluate the reasonableness and effectiveness of alternative solutions.

For example, on Figure 2-0, One Line Diagram, we see NSP's contingency analysis that shows line overloads that could occur, such as the 196% line loading between High Bridge and Rogers Lake, but we don't know how much of a problem this is. We assume that this anaysis is done under peak demand conditions because evaluating a system at peak demand conditions shows worst case scenario. However, typically, peak demand conditions exist for only several hours per year, and those conditions may not be the best basis for system planning in this situation.

Transmission planners use deterministic methods to evaluate system performance in response to power line and power plant outages. A deterministic analysis assumes that a single or double contingency will occur. No consideration is given to the likelihood that a specified outage will occur. It is reasonable to evaluate system performance using deterministic scenarios to gain insight as to system performance under any number of scenarios. However, the development and implementation of system deficiency solutions should be tempered by a probabilistic analysis in which the likelihood of critical, outages is considered. These solutions should be further tempered by the concerns and needs of the affected communities. Using these guidelines, it is possible to develop solutions that protect system reliability and are responsive to environmental and community concerns.

Utilities present transmission need situations as if we're on the brink of disaster, but the conditions that they are trying to address are conditions that typcially exist for only a very short period of time, i.e., the several hours per year of peak demand that have a low probability of frequent occurrance. Solutions proposed by the utility have to be tempered with the realistic expectations of system behavior and performance.

12. Transmission Line Data.

The proposed project, shown in the top grouping in the chart, will have the highest capacity provided by the higher thermal limits of200 degrees C and demonstrated in the Amps and MVA columns, all under "Conductor Rating." However, one can't look at this table and say, 'This tells us how it will perform when it's installed." It doesn't tell us about system performance and when all is said and done, that's what we care about. It is also impossible to look at the ratings for Alternative 1 and conclude that it is a more robust or reliable solution. The ratings shown are based on the conductor type and voltage. Each grouping has many variable components, and it's difficult to evaluate because we're not comparing like items. It is possible to replace the listed conductors with other options that provide more capacity, and we don't know what the criteria was for selection of this type. There is some flexibility in component selection by transmission engineers, so if there is some desire to provide higher line capacity or regional benefits than required simply to serve local load, then those criteria would govern the selection of conductor types and other equipment.

13. Normal line loading.

Each grouping by alternative shows a Line Rating MVA in the first column to the right. The information provided for the individual alternatives should be compared with the Line Rating MVA. The 'line rating" column shows how much each line can handle, and we then look at the loading for each alternatives. The system performance is going to be

comparable for each system component. Each of the alternatives presented would be sufficient for the claimed purpose of the line. Each alternative results in line loading of approximately one-third of capacity, a reasonable value for transmission line loading under normal conditions.

14. Alternative Plan Comparison.

This chart compares milages of the various alternatives and their components. It is worth noting that the preferred alternative, 'New Line," includes 14.2 miles of new powerline whereas alternative 2 and alternative 3 are only 8.4 miles each of new powerline, and alternative 4 is 10.4 miles of new line. NSP's preferred route requires 5.8 miles of additional new transmission lines over the next highest option. New lines also require new structures, and logically, the less miles of new line there are, the less miles of environmental and community impact. It appears that the High Bridge to Rogers Lake rebuild will be done on the same structures, having little comparable impact. Based upon the available information, which really isn't sufficient upon which to base a definitive opinion, it appears that Alternative 2 would be the best option, because it would have the least impact based upon the lower number of new circuit miles and that much of the upgrade could be accomplished without the construction of new power lines and support structures.

Packet with Figure 3-1 Wood H-Frame

15. Table 3-1 Projected Electrical Loadings.

This table is meant to show Projected Electrical Loadings, but it doesn't provide a ready means to compare peak load or load changes, which vary year by year We don't know if this is loading based on native load or if this is based on system interconnected load, and it doesn't give us a means to evaluate alternatives. The primary useful information this chart provides is verification that the projected electrical loadings will be increasing substantially

over time. In 1999, starting with 567 amps, we increase to 1512 amps by 2020, and that's normal loading, that is an increase of 167% over 21 years. For peak loading over the same period, the increase will be l82% over peak load of 1999. With this near doubting of current, the magnetic fields will increase in nearly linearally proportion. The utility's claim is that magnetic fields will be cut in half through phase cancellation, but with a doubling of current and increasing magnetic fields, the net result is no substantive change from the current fields.

Conclusions

16. In addition to the three identified alternatives, there are other options that are consistent with good public land use policy and utility regulatory policy that should be considered. These include requiring that NSP underground any construction that takes place in densely populated urban areas, with costs apportioned *within* entire system for the benefits of system improvements, and second, to require through local land use controls that NSP give best efforts to construct the needed powcrline along existing state or interstate highway rights of way.

Our contention is that NSP has an obligation as a public service corporation to meet its relabiity requirements with consideration of the needs, concerns, and culture of the communities in which they're doing business. This may require more work or thought on the part of utilities and decision-makers, but it is not an unreasonable expection because the people of *these* communities have to live with this powerline for many years. NSP must go the extra mile, to look for alternatives and to demonstrate responsiveness to the citizens of the metro area. The only way to do this is to fully evaluate the impact of the proposed line and to demonstrate the same commitment that they've shown to the preferred route to the development of technically, economically, and socially responsible alternatives.

17. I am struck by the paucity of information available about this proposed line. In my experience with other utility applications for similar power lines, the application provided a comprehensive statement of the problem and proposed solution. The need was rigorously justified based on detailed area load forecasts, the impact of conservation programs, the results of all analyses under normal and contingency conditions, and potential transmission and non-transmission alternatives. With all due respect to the regulatory and statutory requirements of the State of Minnesota, the Environmental Assessment Worksheet and, supporting documents that I have reviewed are woefully inadequate and do not provide a foundation with which regulators and decision-makers can ensure the public interest has been well represented

Important information known only to MAPP and the utility and relevant to development of this system improvement was not available to the public or decision-makers. This newly discovered information presents, three heretofore undisclosed viable alternatives to the project as proposed, with one alternative that would apparently have less impact than either of the other alternatives or the utility's preferred line. These alternatives must be considered and the record sufficiently developed to provide the basis for a reasonable and informed decision.

Further your affiant sayeth not,

David A. Blecker. P.E,

Signed and sworn to before me this
__ day of_____ 2000.

Notary Public

David A. Blecker, P.E.

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Areas of Expertise
❒ Transmission system modeling, access, pricing and policies
❒ Renewable energy systems development and policy analysis
❒ Green power program development and markets
❒ Distributed generation systems
❒ Community based energy programs and management
❒ Native American energy issues
❒ Economic and financial analysis including pricing and costing

Mr. Blecker has been the President of Earth Energy Systems since its formation in 1998 and Director since August 2000. Blecker has worked professionally as an energy engineer and policy analyst since 1992. His areas of expertise include renewable energy systems development and supporting policies, transmission system planning, analysis and modeling, utility system planning and distributed resources, and the environmental impact and economic impact of energy use and production. He has worked for a diverse range of clients ranging from the U.S. Department of Energy, the U.S. Justice Department, public and private electric utilities, independent power producers, local governmental agencies, Native American Tribes, to national and local environmental groups and grassroots organizations. Mr. Blecker has served as an expert witness in contested utility planning cases on renewable energy and transmission planning issues.

Recent projects include:

- Renewable energy project development for community and economic vitalization of American Indian and Alaskan Indigenous Peoples.
- Transmission system planning and analysis including access, capacity and rate issues.
- Design of community-based energy planning models for local governments.

Mr. Blecker has also developed new transmission and distribution system planning tools and analytical methods to implement distributed generation and targeted demand-side management programs in the restructured utility environment. This work has been successfully applied in cases before the Wisconsin and Ohio regulatory commissions. As well, he has testified as an expert witness and assisted citizen and environmental organization in power line cases in Arkansas, Minnesota, Ohio, Virginia and Wisconsin.

Blecker also leads and serves in many professional organizations. He is the Vice-President of the Midwest Renewable Energy Association, former Board member of RENEW Wisconsin, Co-Chair of the Energy Center of Wisconsin Technology & Systems Transfer Committee and an Energy Center Public Caucus member, Co-Chair of his town's Planning Committee, former Technical Director of the Wisconsin Solar Use Network, former Co-Chair of the American Solar Energy Society "Solar 2000" Conference Organizing Committee, and he is a member of the American Wind Energy Association,

National Wind Coordinating Committee Transmission Working Group and Institute of Electrical and Electronic Engineers.

Mr. Blecker, a licensed professional engineer in the state of Wisconsin, holds a Bachelors degree in Electrical Engineering from Rensselaer Polytechnic Institute and is completing his Master's Degree in Land Resources with an emphasis in Energy Analysis and Policy at the University of Wisconsin-Madison. Mr. Blecker served as Senior Engineering Associate with MSB Energy Associates in Middleton Wisconsin from 1992 through 2000, and prior to joining MSB, he designed submarine power control systems for General Electric. He also served four years in the U.S. Navy onboard nuclear submarines as a ballistic missile weapon system supervisor.

Selected Publications

"County Energy Management Plan." Prepared for the Chisago County (MN) Board of Commissioners, September 2000.

"Renewable Energy: Development Options for Alaska Natives." September, 1999.

"Green Power Program Feasibility Study." Prepared for Confidential Investor-Owned Utility Client. December, 1998.

"Wind Power Development Feasibility Report." Prepared for the Native Village of Point Hope (Alaska). July 8, 1998.

"Confidential Power Plant Transmission Access and Contract Analysis." Prepared for Enron Corporation . May, 1998.

"Eastern Interconnected Bulk Transmission System: Performance, Trends and Availability." Prepared for Confidential Client. March, 1998.

"Renewable Energy, Conservation, Generation and Transmission in the Upper Midwest." Prepared for the Energy Foundation, December, 1997.

"Integrated Targeted Area Resource Planning: A Planning Model for Transmission and Distribution Systems in the Restructured Utility." Prepared for the US Department of Energy. July, 1996.

Selected Presentations

Wind on the Wires, Transmission Issues for Wind Development in the Dakotas, South Dakota PUC Wind Energy Conference, Brookings, SD. September 19, 2000.

Midwest Transmission Issues for Renewable Energy, High Plains SEED Conference, Madison, WI. June, 200.

Renewable Energy Development Options for Alaska Native Tribes, Two-day workshop presented to ten Alaska Native Villages in northwest Alaska, Noorvik, AK. March and April, 2000.

Renewable Energy in the Midwest, Guest lecture for the University of Wisconsin Atmospheric Sciences Lecture Series, Madison, WI October 18, 1999.

Renewable Energy: Powering Iowa, Keynote speaker at "Iowa 2000" Building Operators Workshop, Des Moines IA. October 4, 1999.

Tribal Utilities: Opportunities and Challenges, Midwest Renewable Energy Fair, Amherst, WI. June 1998 & 1999.

Strategies for Grassroots Energy Policy Intervention, Midwest Renewable Energy Fair, Amherst, WI. June, 2000 and 1999.

Transmission Issues in the Competitive Market, High Plains SEED Conference, Annendale, MN. December 14, 1998.

Renewable Energy Development for Native Communities, Flandreaux Sioux Tribe, Flandreaux SD. June 30, 1998.

Transmission Issues for Wind Energy Development, National Wind Coordination Committee, Sioux Falls SD. June 29, 1998.

Renewable Energy Development for Alaska Native Communities, Native Village of Point Hope, Point Hope, AK. June 26, 1998.

Testimony

Minnesota Environmental Quality Board. Docket MP-HVTL-EA-1-99, OAH 9-2901-12620-2. Testified on behalf of a citizen's group (Save Our Unique Lands) as to proper utility air emissions modeling and analysis methods in response to Minnesota Power's application for exemption for its proposed Arrowhead – Duluth 345 kV power line.

Virginia State Corporation Commission. Case No. PUE-970766. Testified on behalf of the Bland County (VA) Board Of Supervisors as to the adequacy and alternatives with respect to American Electric Power Company's construction authorization request for the Wyoming-Cloverdale 765 kV Transmission Line Project and the Wyoming-Jacksons Ferry 765 kV Alternative Transmission Line Project. March 22, 2000.

Minnesota Environmental Quality Board, Docket Number NSP-TR-4. Testified on behalf of the Concerned River Valley Citizens as the prudency and alternatives to a Northern States Power Company proposed 38 mile 230 kV power line. November, 1998.

Arkansas Public Service Commission, Docket Number 98-141-U. Testified on behalf of landowners as to the adequacy of a $25 million, 24 mile, 161 kV transmission line application submitted by Entergy Corporation. August, 1998.

Ohio Power Siting Board, Docket Number 95-600-EL-BTX. Conducted a review of a proposed 138kV transmission line and developed several alternatives to serve area loads including distributed generation and lower voltage transmission options on behalf of Citizen's for a Better Way. December, 1996.

Wisconsin Public Service Commission Advance Plan 7, Docket 05-EP-07. Presented an engineering and economic analysis of a renewable energy based long-range state energy plan on behalf of RENEW Wisconsin and Wisconsin's Environmental Decade.